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ED 502 Teaching Reading
07-12-93

Journal Articles: The Process of Knowing in Curriculum, by Garth D. Benson and Bryant E. Griffith.

Continuing in my quest for the epistemological holy grail, Benson and Griffith serve up a concise treatment of three common epistemological models. The gist of this, and other epistemology articles, seems to be about trying to develop a curriculum that encourages higher levels of learning than memorization, recitation, and simple application.

Benson and Griffith note:

Our epistemological model differs from previous models most strikingly in its emphasis upon the process of knowing.

They want to replace the typical direct cause-and-effect model with a "three-dimensional" approach to understanding historic events, for example. They espouse to the belief in "Relational Understanding." They want to place the event, the bit of knowledge or learning in its relationship with other events or causes or effects. It's a bit like Prawat's "Contextualism" (Prawat, "Teacher's Beliefs about Teaching and Learning").

Compared to the last several articles, this one is almost boring in its balance and feasibility. This article would seem to be a good starting place for teachers interested in understanding how epistemology or the "how we knowing" effects our learning strategies.

What do you think?
Would you agree?

I love this!!

Much like
we've discussed
process
vs.
product

You've
really
chosen
some
great
articles!

THE PROCESS OF KNOWING IN CURRICULUM

Garth D. Benson and Bryant E. Griffith

This article will explore the relations between epistemology and curriculum and will present an epistemological model based on an alternative way of knowing. Rather than being merely a prescribed set of technical skills, learning should encompass the epistemological assumptions that underlie the process of knowing. This article is applicable to general education because it not only addresses students, for whom a curriculum is developed, but also asks *why* teachers teach in the way they do. We are speaking to all educators, not just to those interested in science or social studies. The essence of our argument is important not only for classroom teachers and pupils but also for other interested stakeholder groups. Generally, we will argue that it is critical for every individual to understand the intellectual foundation of knowing. Without this understanding, it is all too easy for individuals to lapse into technically driven ways of knowing. At issue is the question of the philosophical bases of curricula in today's schools and how those curricula tend to generate static, absolute knowledge. The process of knowing is offered as an alternative for a curriculum model that encourages self-knowing—knowing why we think and understand the world as we do. It is a historical process linking ideas of the past to ideas of the present; it also allows us to understand the thoughts of our contemporaries by knowing how our own minds work.¹ The process of knowing calls for a change in educators' understanding of the nature of knowledge with a resulting change in curriculum.

First, we will discuss the epistemological models of positivism, naive realism, and idealism in relation to knowledge in schooling. Second, we will argue that if schooling continues with the foregoing foundation, static, absolutist, knowledge

results. Third, we argue for a curriculum model based on the process of knowing and point out its advantages.

Epistemological Models

The many epistemological models operating within our educational system today can be seen to conform to a particular paradigm: that knowing about *x* means knowing how *x* operates. What is important in this system is how factual knowledge is accumulated and how the learner uses those facts in appropriate ways to sustain the model. In this paradigm, schooling too often becomes a process of memorizing facts or static definitions rather than one of seeking to understand the ways in which our minds work now or have worked in the past. For example, if students were given a list of the perceived causes of World War I, the list should represent the necessary and sufficient conditions for understanding that event. The list of perceived causes of World War I would include the assassination of the Archduke Ferdinand. In many classrooms this event alone is taught as the cause of the conflict. To promote a fuller understanding of the causes of the war, we would include asking *why* particular events occurred. For instance, why did a group of terrorists, called the Black Hand, want to assassinate the archduke? Related to this question would be, Why were armies put in a state of readiness *prior* to the assassination? In order to understand the process of knowing, we need to ask an ongoing set of *why* questions. The educators' role at all levels is to create the opportunity for *why* questions to be asked so that learning can occur. Without *why* questions, knowledge becomes static, absolutist, and imposed.

Positivism

Of the many epistemological models currently found in formal education, positivism, often in its most basic and extreme forms, is still prevalent. Although positivism is rarely directly espoused in courses of study in schools or in teacher education programs, the belief that all knowledge is quantifiable, measurable, and testable persists within the foundational assumptions

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of schooling. We are not arguing that this model is inappropriate for specialized educational contexts. For instance, in certain limited teaching and learning situations, it may be desirable to consider learning as behaviorally oriented and therefore measurable. In selected instances behavior modification may be used to predict and control students' actions in classrooms. In a general way behavior modification allows us to be aware of extreme aberrations in student behavior that might affect classroom management. This is useful in preparing a teacher for possible educationally disruptive situations. Where it is undesirable is in the stereotyping of individuals and the blanket use to control behavior that is not consistent with the teacher's expectations. We will argue that positivism is neither adequate nor appropriate for *all* knowing or teaching. Being concerned about the etymology of education means that we lead students to various understandings; we do not impose, quantify, and measure knowledge.

Our position, as this article demonstrates, stresses self-knowing; knowing how our minds operate here and now helps us to make logical connections about how others think and allows us to define what it means to be rational. Nowhere has this been shown more clearly than in the present *glasnost* between East and West. The "better dead than red" slogan of the United States and the corresponding claims of the Soviet Union have dissolved, a prevalent opinion being that ideology has failed. It is not simply a failure of communism; it is also a failure of capitalism. The common ground between East and West is based in part at least on people asking *why* questions. The answers to these questions have a logic and rationality of their own that each side can understand.

Naïve Realism

The epistemological model of naïve realism is part of the groundwork of positivism and structures the way in which most people make sense of the world. Simply put, positivism claims that objects exist independently of us. In other words, the sun will rise tomorrow regardless of any action we take. According to the model based on naïve realism, we derive knowledge of independent material things from sense-data that are directly related to perceptual consciousness. While we hold that some

form of realism is necessary to help children make sense of the world, we want to omit the exclusive influence that this model has in defining the nature of knowing. In too many classrooms students are taught that a direct one-to-one correspondence exists between perceived actions and explanations. Naïve realism implies that perception is equivalent to truth and is universally assumed. Using this method restricts the rich variety of human understanding and prevents independent thinking and interpretation.

Idealism

Idealism as an epistemological model holds that reality exists only in the human mind and that no one way of looking at reality is better than any other way. This form of idealism is also found in some versions of pragmatism, which maintain the importance of perception. For example, a puddle of water that suddenly appears on a hot day as we drive down a highway is real because we perceive it, even though we know it is a mirage. In the fullest sense, idealism holds that "to be is to be perceived."² Bishop Berkeley's claim that matter does not exist except in the form of ideas is a quintessential example of this position. Whether or not this is a correct description of the world, it is certainly not one that is acceptable to most people. Schooling is viewed by the majority as a way of producing productive, responsible citizens who share common goals and common views of the world. Idealism promises diversity and individuality but offers little or nothing in the way of a shared, collaborative understanding of how we know.

The Process of Knowing

As long as schooling is contextualized into distinct areas of subject matter that stress positivism, naïve realism, or idealism, content and thinking will not overlap; learning becomes abstract and therefore meaningless. By meaningless we refer to the application of learning about the world in algorithmically driven technical language.³ For us, knowing about the world in whatever form or subject area, is reflective and contextual; it is dependent upon thinking as a process. Therefore, education

should be concerned with how we understand the process of the development of ideas and how we fit into that process. For example, taking action against a racist and oppressive government is meaningful only if we put the situation in context. On the other hand, knowledge separated from context becomes abstract and is easy to dismiss. For example, if the present condition of Native Americans is considered within the context of ongoing European intervention, then reflecting on these conditions indicates that we are collectively involved in misrepresenting people by using technical language. However, if we abstract the culture of Native Americans through technical language, we separate ourselves from the ways in which Native Americans know and understand the world.

Our epistemological model differs from previous models most strikingly in its emphasis upon the *process* of knowing. The transmission of ideas from one person to another or from one age to another has no absolute beginning or end; rather, the process is centered around self-knowledge. Our knowledge should reflect our interactions among ourselves and others. We do this by asking *why* questions—*why* something happens.⁴ This kind of questioning stimulates the creation of self-knowledge and allows us to use such tools as analogies and metaphors in teaching and learning in order to understand the world. It also evokes the need for holistic ideas that help us understand the world in context—ideas that fill the enormous gap between what learning describes and what we experience as sensitive, thinking human beings. Assuming the position that education is a process in which students actively create both historical and contemporaneous knowledge, our model helps students become aware of themselves as responsible thinkers and knowers. In this way this article is partly philosophical and partly practical. It expresses our conviction that school curricula must be changed so that static, absolutist knowledge is no longer the only valid form of knowledge in the classroom.

Static Knowing in Curriculum

In 1985 Peter Fensham addressed the question of what kind of science is to be taught and to whom. The "science-for-all" de-

bate has broad implications for schooling. Most pointedly it is: What should we teach? For example, is it important for lawyers, judges, and politicians to understand the scientific basis and technical application of the Borkenstein breathalyzer apparatus in order to assess the condition of drunk drivers and also to formulate laws?⁵ The basic rationale of the science-for-all movement is well intentioned,⁶ the general argument being that science courses are elitist because they are designed for a small percentage of students who will continue in the field of postsecondary institutions.⁷ The point is made that no matter what occupation or position one takes in society *all* students, tomorrow's decision makers, need to be well informed about science.

On the surface this argument is sound and justified. But when we examine science-for-all courses, we find that many of them are still highly content-oriented.⁸ As a result, science instruction in all probability will continue in the traditional manner of teaching wherein knowledge is static and knowing involves no more than accumulating and disgorging information. What is lacking in both the old and new approaches is a curriculum based in epistemology, one in which the process of knowing is expressed through relational understanding.

Relational Understanding

Richard Skemp makes a useful distinction between instrumental and relational understanding.⁹ Instrumental understanding is the possession and application of "rules-without-reason," whereas relational understanding involves the recitation of information without discerning meaning. In calculus it is possible to differentiate expressions such as $6x^3$ to $18x^2$ through a mechanical process and arrive at an appropriate answer. However, we can arrive at the answer simply by following the equation. We do not need to understand in order to perform the operation. This is the kind of understanding that is encouraged in today's schools when positivism, naive realism, or idealism form the foundation of the curriculum. In contrast, relational understanding provides a meaningful context for understanding concepts and their relationships. Relational understanding is tentative, however, in that relationships are not permanent; they are open to change or abandonment. Relational under-

standing is the result of coming to terms with the process of knowing. Through it, meaning is developed by communicating ideas in context.

In place of a traditional curriculum that encourages static knowledge and instrumental understanding, we suggest a curriculum based on a process of knowing that results in relational understanding.

An Alternative Model of Knowing in Curriculum

In contrast to current models of curriculum, we suggest a model that emphasizes the learning of skills and concepts within a framework of ideas and principles where relationships are identified across domains of knowledge. This model focuses on the form and content of knowledge and on such questions as: What is knowledge? How do our world views influence knowledge? Why and how is knowledge created? Why does knowledge change? and, Why does knowledge convey certain meanings?

The curriculum is organized around the process of knowing, the nature of knowledge, and on relational understanding so that students arrive at self-knowledge by understanding the relationships among concepts. Students are expected to relate and interrelate the form and content of knowledge of one area with another. For example, we would ask students a *why* question: What were the social, political, economic, and religious factors that influenced the scientific work done by a group of biologists in Berlin in 1848?¹⁰ Students would be asked to develop relationships between the form and content of science and history through a question such as: Was the work of the German physiological reductionists Emil Du Bois-Reymond, Ernst Brücke, Herman von Helmholtz, and Rudolf Virchow influenced by the political absolutism and religious conservatism of the European revolution of 1848? If so, why?

The teacher's role in such a curriculum becomes one of facilitator and questioner rather than a transmitter of information. The intention is to have the teacher raise questions for discussion. The student's role becomes one of questioner, synthe-

sizer, and analyst. Students are to be critical and question the epistemological foundations of the knowledge presented. They are to be self-critical about the way in which they come to understand and reflect upon the process they use to know. Consequently, in this curriculum model knowing is more than being able to recite a litany of dry, dusty facts; it is a historical process in which students become aware of *how* they know.

The difference between our model and current curricula is founded on a conviction that interests, intents, and style of teaching change when the process of knowing becomes a focus. Teachers by necessity shift from a transmission mode of content to asking *why* questions, and this encourages relational understanding. The key focus for teachers is to make students aware of why they create relationships among selected aspects of constructed reality. In this way, students establish relationships between previous experiences and present experience.

Students are encouraged to make connections among ideas that signify the cultural influence on those ideas. The signing is pointing toward the ways in which the students' ideas developed; it also points to how they come to understand. In this way the understanding is relational because of the connections made. A measure of this understanding is a student's ability to communicate coherent conceptions of the relationships or connections, use a reasoned argument to account for the connections that were made, and be able to relate past ideas to present ideas, as well as relating one person's ideas to those of others.

It is possible for students in any field to learn about the past shape of knowledge because a dialectical continuum links the past to the present. This dialectic is centered in the individual's ability to know herself. Usually it centers around the asking of *why* questions, which frame intentions and focus on the specific process of knowing why and therefore how knowledge, or ideas, has changed from the past to the present. This process enables students to understand how the mind works, or how a person comes to know. If language, worldview, and absolute presuppositions are similar from one person to another, then one is able to understand how that other person thinks. Therefore, understanding is possible both vertically (historical knowing) and laterally (contemporaneous knowing).

Implications for Teaching and Learning

A significant question that arises from rejecting conventional curricula and positing the process of knowing as an alternative is how it affects teaching and learning. Given that part of the process of knowing is reflective, it means teachers and students alike must explore the process of thinking. Teachers and students need to think about why and how they construct knowledge. For students, an essential part of this reflection is having them question the premises that govern their views of the world as well as the premises of the knowledge teachers present to them. In addition, teachers must ask the equivalent questions for their own knowledge.

Recommending the process of knowing as a basis for curriculum has major implications for teaching. The change required of teachers is more than accommodating new textbooks or learning new concepts. It involves a new epistemology and thus requires that teachers change their conceptual structures, that is, to recognize that current theories of knowledge are not founded solely on formal logic using uninterpreted experience as data. Current theories of knowledge recognize the influence of tangible belief systems. What is accepted as knowledge is historically influenced and partially subjective.

From our perspective, the first goal of teaching is to enable students to see that knowing is an ongoing process that they can understand relationally. As Skemp points out, encouraging students to learn instrumentally destroys their curiosity, self-confidence, and independence. Conversely, relational learning encourages independence and personal responsibility; it helps students inquire about the process of knowing. It also helps students establish relationships among forms of knowledge and to understand how knowledge is created and influenced. To do this, we need to change how people understand the nature of knowledge and its relation to curriculum.

Notes

1. The argument of knowing as a historical process is based on R. G. Collingwood's theory of historical reenactment. See *The Idea of History* (Oxford: Oxford University Press, 1946).

2. The main problem here is the direct connection people make between their uninterpreted experiences and knowledge. For this aspect of idealism, see A. R. Lacey, *A Dictionary of Philosophy* (London: Routledge & Kegan Paul, 1976). This connection raises questions of the correspondence theory of knowledge and to what degree the continuity and coherence of the everyday world coincides with what we know. See John Ziman, *Reliable Knowledge* (Cambridge: Cambridge University Press, 1978), and R. N. Giere, *Explaining Science* (Chicago: University of Chicago Press, 1988). Giere discusses this problem in relation to realism.
3. The question of technical rationality and its relationship to education and knowing is discussed in a special issue of the *Journal of Education Thought* 22(A) (October 1988). The papers, from a variety of disciplines, are rooted in phenomenology, hermeneutics, ethnomethodology, and recent Marxist studies.
4. Collingwood, *The Idea of History*.
5. Glen Aikenhead uses this example in *Science in Social Issues: Implications for Teaching* (Ottawa: The Science Council of Canada, 1980) to point out the need for adequate scientific literacy in all citizens.
6. P. J. Fensham, "Science for All: A Reflective Essay," *Journal of Curriculum Studies* 17(4) (1985): 415-35. See also F. Jenkins, "S-T-S Science Education: Unifying the Goals of Science Education" (Curriculum Support Branch, Alberta Education, Edmonton, 1990).
7. Fensham, "Science for All"; Aikenhead, *Science in Social Issues*, 27.
8. Jenkins, "S-T-S Science Education," 3.
9. R. R. Skemp, "Relational Understanding and Instrumental Understanding," *Mathematics Teaching* 77 (December 1976): 20-26.
10. W. Coleman, *Biology in the Nineteenth Century* (New York: John Wiley & Sons, 1971); E. Mendelssohn, "Revolution and Reduction," in Y. Elkana (ed.), *The Interaction Between Science and Philosophy* (Atlantic Highlands, N.J.: Humanities Press, 1974) 407-26; idem, "The Social Construction of Scientific Knowledge," in E. Mendelssohn, P. Weingart, and R. Whitley (eds.), *The Social Production of Scientific Knowledge*, vol. 1 (Dordrecht: D. Reidel, 1977), 3-26; C. U. Moulines, "Herman von Helmholtz: A Physiological Approach to the Theory of Knowledge," in H. N. Lohrke and M. Olne (eds.), *Epistemological and Social Problems of the Sciences in the Early Nineteenth Century* (Dordrecht: D. Reidel, 1981), 67-73.